

CORS Program FY09

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What is the Continuously Operating Reference Station program?

- A number of products and services that directly support NGS's mission: Defining, maintaining and providing access to the National Spatial Reference System (NSRS) for the civilian sector of the US government.

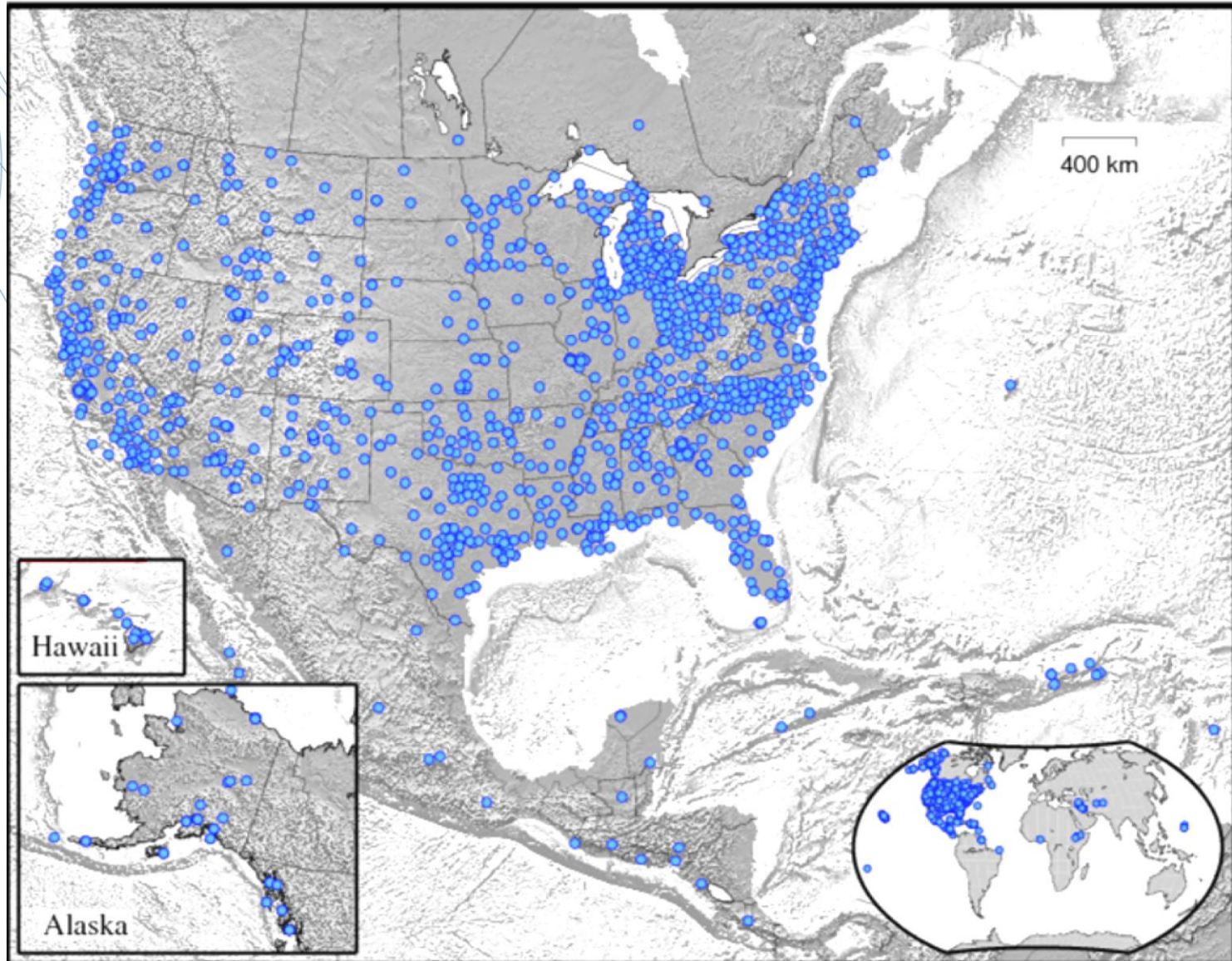
How:

- Each CORS provides the most basic information (code and phase data) needed to calculate its coordinate and velocity. The relationship of the coordinates and velocities at CORS with the International Terrestrial Reference Frame (ITRF) is used to define the geometric component of the NSRS (lat, lon, ellip. ht).
- Collect GNSS data, calculate orbits, coordinates + velocities, establish guidelines, provide post-processing applications, provide training

CORS Network September 2009

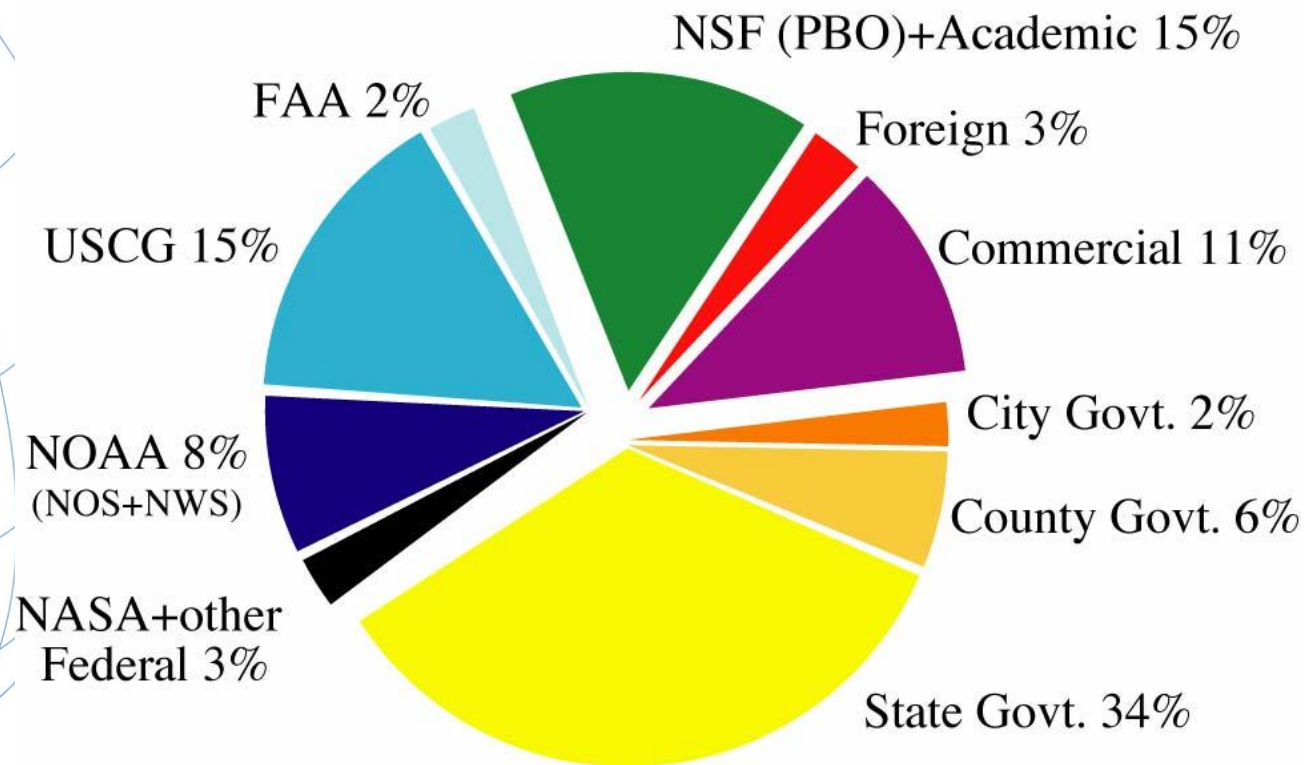
~1370 Stations

This year added
~180
and
transferred
~140 Coop to
National CORS



CORS = Partners

- CORS is > 98% volunteer (non-NGS)



CORS Activities FY 2009

- Completed re-analysis of GPS orbits from 1994 to present
- CORS data re-analyzed from 1995 to present
- Began discussion on introducing a new geometric datum
- Added ~180 stations + merged ~140 Coop CORS
- Established 6 CORS in Benin to support Millennium Challenge Account
- Supporting new CORS in Iraq and Afghanistan
- Introduced ability to share OPUS results (OPUS-DB)
- Began development of GLONASS processing capability
- Stream data from 8 NGS owned and operated CORS in RTCM (no correctors)
- UFCORS available from CORS-West (alt.ngs.noaa.gov/UFCORS)
- Socio-economic valuation of the CORS program

Main Focus of CORS Program

- Maintain and improve the NSRS (geometric component)
 - Keep it consistent with the ITRF
- Support current CORS and add new CORS
 - Streamline current data ingestion and computation
- Add new products
 - Real time activities,
 - Processing GNSS data sets (not there yet)
 - Distributing GNSS data sets
 - OPUS enhancements

Maintaining/Improving the NSRS

- Reprocessing is proceeding on schedule (finish Nov 2009)
- Focus on velocity estimates and identifying discontinuities
- Current NSRS geometric datum is NAD83(CORS96) aligned to ITRF2000

Need to update geometric datum:

- Geocentric vs non-geocentric? NAD83 (CORS96) is non-geocentric ~2m off
- Epoch date? Current is 2002.0 new one 2010.0?
- Which plate model should be used? Current is NUVEL-1A
- What do we call the new geometric datum? NAD83 is legally binding
- Provide new/upgraded stations for the tie to ITRF (Foundation CORS)

Support Current CORS and Add New CORS **meta data are AS IMPORTANT as the data**

- Added ~180 stations to the network.
- Merged COOP CORS with National CORS in accordance with the 10 year plan
- New CORS must conform with guidelines
[www.ngs.noaa.gov/CORS/Establish_Operate CORS.html](http://www.ngs.noaa.gov/CORS/Establish_Operate_CORS.html)
- New data storage array in October 2009
- Currently no new CORS are being added until disk storage issues are resolved

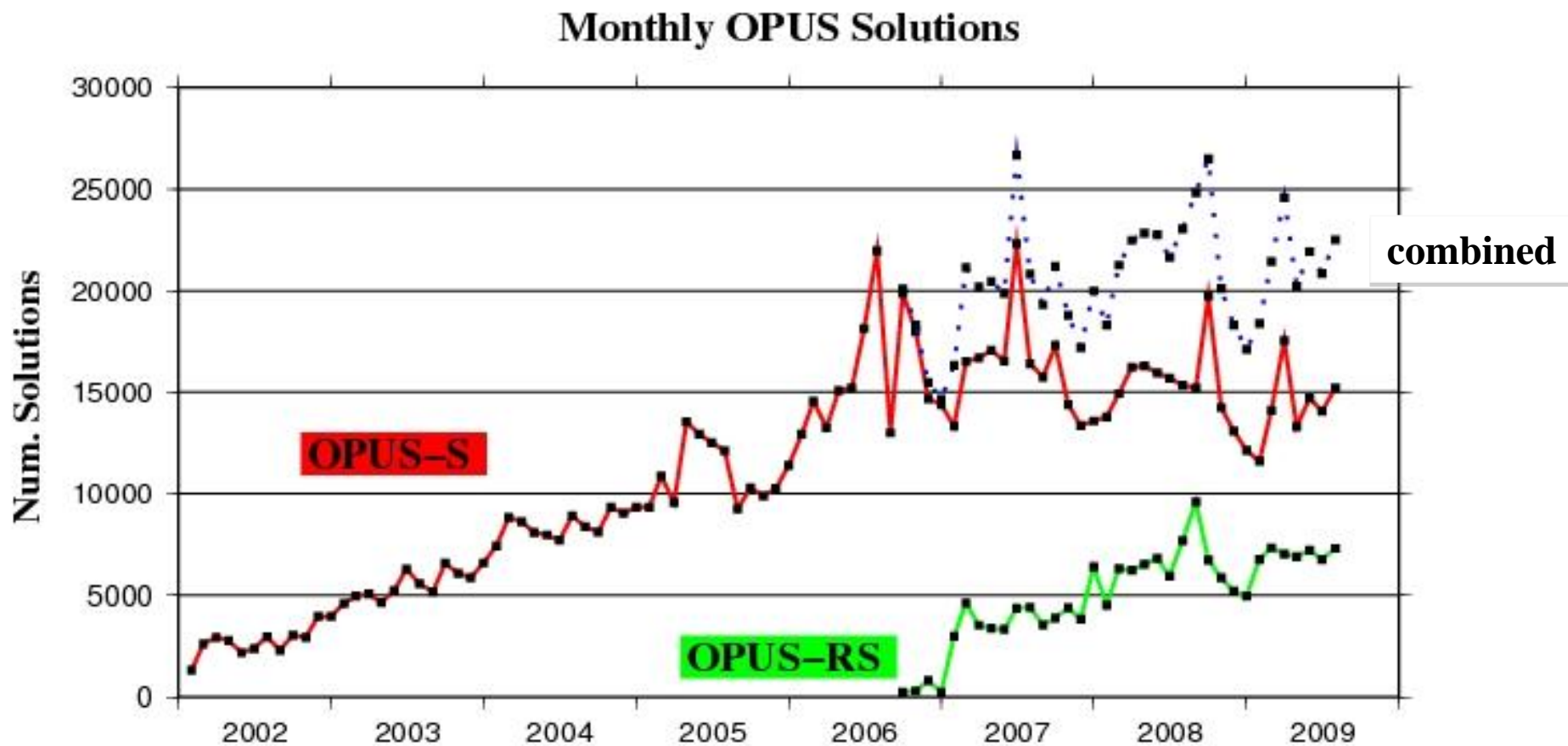
OPUS (Online Positioning User Service)

A collection of web services to provide access to the NSRS

- OPUS-S (static) robust product
- OPUS-RS (rapid static) continues to increase in popularity
- Added functionality to share OPUS results (OPUS-DB)
- Under development (NO timeline)

OPUS-Projects - multiple sites all adjusted simultaneously to replace blue booking (in beta testing)

OPUS (Online Positioning User Service)



Socio-Economic Study of CORS and GRAV-D

- Independent scoping study of the value of CORS and GRAV-D
- Estimate magnitude of benefits of the NSRS are \$2.4 billion/yr
- CORS program provides ~ \$758 million/yr of benefits
- GRAV-D program will provide ~\$522 million/yr of benefits
- CORS products and services and associated usage has been growing at 22% since 2003
- Project the use of CORS over 15 years with a 0% growth yields \$6.9 billion of benefits or with 15% growth then \$18.5 billion of benefits
- A detailed socio-economic study is planned for this year
- Full report available at www.ngs.noaa.gov

Plans for FY 2010

- Complete re-analysis of CORS especially to identify discontinuities
- Plan and establish a new geometric NSRS datum
- Store and distribute GNSS data
- Extend HTDP to Alaska
- Continue to work with our partners to improve existing stations and add new ones
- Make OPUS-S and OPUS-RS available from Boulder as alternate location
- Produce GLONASS orbits